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EXAMINER	
AMINI, JAVID A	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/627,147	Applicant(s) COHEN ET AL.	
	Examiner Javid A Amini	**Art Unit** 2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-46 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-46 is/are rejected.

7)☒ Claim(s) 1-46 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

1. Claims 1-46 rejected under 35 U.S.C. 102(a) as being anticipated by Freeman US patent 6,115,052.

2. Claim 1,

Freeman et al. hereinafter, Freeman discloses, "providing a shape or motion that is to be a animated, the examples being provided relative to a multi-dimensional abstract", in (Col. 2, lines 40-48) a simplified rendering domain, that yields an optimal 3-d estimate of human motion (providing a shape and motion) used to create realistic animations given a 2-d temporal sequence (multi-dimensional).

Freeman discloses, "selecting a point within the multi- dimensional abstract space that does not Coincide with a point that is associated with any of the examples, the selected a point corresponding to a shape or motion within the abstract space", in Figs. 5a, b, and c, that diagrammatic representations showing three random draws from the gaussian prior distribution over the 37 3-d marker positions (a point within the multi-dimensional), with the results all looking human, and corresponding roughly to human motions (selected a point corresponding to shape or motion).

Freeman discloses, "computing a single and combining the single weight values for each of the", in (Col. 2, lines 7-24) equation 1, which reflect the weights of the image data (computing and combining

the weight values), the priors over human motions, and the interactively specified 2-d point matches.

3. Claims 2 and 3

Freeman discloses, "selecting is performed by an application; and by a game application", in (Col. 1, lines 19-22) that Many computer applications would follow the same abilities to infer 3-d motions. There are applications to public safety for elevators and escalators, as well as in interactive games, and virtual reality.

4. Claims 4, 5, and 6

Freeman discloses, "Selecting and computing and combining are performed at run time", see Fig. 5, which Gaussian distribution provides a useful prior model for how a human moves over time (run-time). And also Freeman teaches in (Col. 10, line 42-46) that an initial estimate of the marker positions for various time frames can be calculated (computing) from the motion estimates from the previous motion segments (combining).

5. Claim 7,

Freeman discloses, "defining a cardinal basis for each example; evaluating the cardinal basis for each example relative to the selected point to provide the weight value", in (col. 2, lines 29-39) that in the subject invention the 3-d reconstruction in a simplified image rendering domain utilizes a Bayesian analysis to provide analytic solutions to fundamental evaluation about estimating figural motion from image data, which are the definition for cardinal basis.

6. Claim 8,

Freeman discloses, "a radial basis function portion; and another portion that is different from the radial basis function portion", in (col.1, lines 8-11) that the invention relates to a system for recognizing (radial basis) of body motion and more particularly to a system for reconstructing an estimate of the 3-dimensional positions of a human body (combination of different portion) from a live or pre-recorded sequence of images of the body.

7. Claim 9,

As per claim 9, "another portion is not a radial basis function portion", the step is inherent because in order to implement an object motion, an object contains different radial basis portion.

8. Claim 10,

Freeman demonstrated in Fig. 3a, "another portion is a linear portion", and (Col. 1, lines 63-67) that in order to accomplish the optimization, the optimizer finds the most probable linear combination of training data to explain the input video, accommodate user corrections, and be a likely 3-d motion segment.

9. Claim 11,

Freeman demonstrated "instructions are executed by a computer", see Fig. 1, this is inherent because many applications would follow from a computer with the same abilities to infer 3-d motions.

10. Claim 12,

Freeman discloses, "Computer is programmed with instructions which, executed by the system", in (Cols. 11-366) the computer instructions for a system.

11. Claim 13,

Freeman discloses, "Linearly approximating a degree of freedom that is associated with a new form or motion that is to be rendered based upon a plurality of examples that define respective forms or motions within an abstract space", in (Col. 1, lines 63-67) in order to accomplish the optimization, the optimizer finds the most probable linear combination of training data to explain the input video, accommodate user corrections, and be a likely 3-d motion segment.

Freeman discloses, "defining a radial basis function for each of the examples", in (col. 2, lines 29-39) that in the subject invention the 3-d reconstruction in a simplified image rendering domain utilizes a Bayesian analysis to provide analytic solutions to fundamental evaluation about estimating figural motion from image data.

Freeman discloses, "combining the linear approximation and the radial basis functions to provide a cardinal basis function", in (Col. 2, lines 7-24) equation 1, which reflect the weights of the image data, the priors over human motions, and the interactively specified 2-d point matches that provides cardinal basis function.

Freeman discloses, "using the cardinal basis function to render the new form or motion", in (col. 2, lines 29-39) that in the subject invention the 3-d reconstruction in a simplified image rendering domain utilizes a Bayesian analysis to provide analytic solutions to fundamental evaluation about estimating figural motion from image data.

12. Claim 14,

Freeman discloses, "wherein: is said acts of linearly approximating and said defining are performed for each example", in (Col. 2, lines 7-24) equation 1, which reflect the weights of the image data, the priors over human motions, and the interactively specified 2-d point matches.

Freeman discloses, "combining each of the respective linear approximations and their associated radial basis functions to provide multiple cardinal basis functions, one for each example", in (col. 2, lines 29-39) that in the subject invention the 3-d reconstruction in a simplified image rendering domain utilizes a Bayesian analysis to provide analytic solutions to fundamental evaluation about estimating figural motion from image data.

Freeman discloses, "combining the multiple cardinal basis functions to define a function that describes the new form or shape within the abstract space", in (Col. 3, lines 44-48) that the training data is divided up into snippets or segments which define so called basis vectors for human motion. Multiplying these values by coefficients and adding the results yields the new motions.

13. Claim 14,

Freeman discloses, "linearly approximating and defining are performed for each example", in (Col. 2, lines 7-24) equation 1, which reflect the weights of the image data, the priors over human motions, and the interactively specified 2-d point matches.

Freeman discloses, "combining each of the respective linear approximations and their associated radial basis functions to provide multiple cardinal basis functions; combining the multiple cardinal basis functions to

define a function that describes the new form or shape within the abstract space", in (Col. 3, lines 44-48) that the training data is divided up into snippets or segments which define so called basis vectors for human motion. Multiplying these values by coefficients and adding the results yields the new motions.

14. Claim 15,

Freeman discloses, "scaling the radial basis function for each example", see Fig. 4.

15. Claim 16,

Freeman discloses, "wherein said scaling comprises evaluating a matrix system to ascertain a plurality of scaling weights, individual weights of which are used to scale the radial basis functions", see Fig. 8 shown the resulting estimates from evaluating a function to scaling individual weights for linear combination of basis functions.

16. Claim 17,

Freeman discloses, "wherein said matrix system is configured so that its evaluation yields scaling weights which, when used to scale a corresponding radial basis functions, result in a combination of the radial basis functions and the linear approximation to provide the cardinal basis function", see Fig. 8 shown the resulting estimates from evaluating a function to scaling individual weights for linear combination of basis functions.

17. Claim 18,

Freeman discloses, "the radial basis functions are selected from a b-spline family of radial basis functions", (Col. 2, lines 54-67) the body is transparent, and each marker is rendered to the image plane orthographically.

18. Claim 19,

Freeman discloses, "linearly approximating comprises approximating the degree of freedom with a least squares linear approximation", (Col. 9, lines 39-42) that marker positions are fit to cylinder positions in a simple figure model using least squares techniques.

19. Claim 20,

Freeman discloses, "One or more computer-readable media having computer-readable instructions thereon which, when executed by a computer", see Fig. 1, this is inherent because many applications would follow from a computer with the same abilities to infer 3-d motions.

20. Claim 21,

Freeman discloses, "A computerized blending system that is programmed with instructions which, when executed by the system", in (Cols. 11-366) the computer instructions for a system.

21. Claim 22,

Freeman discloses, "One or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, cause the computer to: linearly approximate a degree of freedom that is associated with a new form or motion that is to be rendered based upon a plurality of examples that define respective forms or motions within an abstract space, by deriving basis hyper planes that fit a least squares hyper plane to a

case where one example has a value of 1 and the remaining examples have values of 0", see Fig. 8 shown the resulting estimates from evaluating a function to scaling individual weights for linear combination of basis functions. And also see Fig. 1, this is inherent because many applications would follow from a computer with the same abilities to infer 3-d motions.

Freeman discloses, "account for residuals between the example values and the hyper plane by: associating a radial basis function with each example; and ascertaining a radial basis weight value for each radial basis function", see (Col. 9, lines 1-5) based on the location of the sticks of the stick figure, a prediction for what the sensors ought to see was formed, assigning a fixed edge strength to each stick. The squared difference between the observed sensor responses and the predictions was penalized.

Freeman discloses, "scaling each radial basis function by its ascertained radial basis weight value", see equation 8 in (Col. 9, line 16).

Freeman discloses, "sum the linear approximation and scaled radial basis functions to provide a cardinal basis function", see equation 9 in (Col. 9, line 16).

22. Claims 23 and 24,

Freeman discloses, "the instructions cause the computer to perform the recited acts of linear approximation, accounting, and summing for each example to provide multiple cardinal basis functions", in (Cols. 11-366) the computer instructions cause the blending system to perform of linear approximation, accounting, and summing for each form to provide multiple fundamental basis.

23. Claim 25,

Freeman discloses, "Wherein the instructions cause the computer to select a point on the defined function and render a new form or motion", in (Col. 3, lines 49-66) that multiplying values by coefficients and adding the results yields the new form or motions.

24. Claim 26,

Freeman discloses, "wherein each radial basis function has a width that is a function of the distance between its associated example and the next nearest example in abstract space", in (Col. 2, lines 7-28) that the optimizer performs its function in accordance with the following formula: equation 1where the distance between its associated form and the next nearest form.

25. Claim 27,

Freeman discloses, "wherein each radial basis to function is selected from the b-spline family of radial basis functions", (Col. 2, lines 54-67) the body is transparent, and each marker is rendered to the image plane orthographically.

26. Claim 28,

Freeman discloses, "at least one computer readable media; at least one processor; instructions resident on the computer-readable media which, when executed by the processor, cause the blending system to: linearly approximate a degree of freedom that is associated with a new form or motion that is to be rendered based upon a plurality of examples that define respective forms or motions within an abstract space, by deriving basis hyperplanes that fit a least squares hyperplane to a case where one example has a value of 1 and the remaining examples have values of 0"; see Fig. 8 shown the resulting estimates from evaluating a function to scaling individual weights for linear combination of basis functions. And also see Fig. 1, this is inherent

because many applications would follow from a computer with the same abilities to infer 3-d motions.

Freeman discloses, "account for residuals between the example values and the hyperplane by: associating a radial basis function with each example; ascertaining a radial basis weight value for each radial basis function; see (Col. 9, lines 1-5) based on the location of the sticks of the stick figure, a prediction for what the sensors ought to see was formed, assigning a fixed edge strength to each stick. The squared difference between the observed sensor responses and the predictions was penalized.

Freeman discloses, "scaling each radial basis function by its ascertained radial basis weight value"; see. equation 8 in (Col. 9, line 16).

Freeman discloses, "sum the linear approximation and scaled radial basis functions to provide a cardinal basis function", see equation 9 in (Col. 9, line 16).

27. Claim 29,

Freeman discloses, "wherein the instructions cause the blending system to perform the recited acts of linear approximation, accounting, and summing for each example to provide multiple cardinal basis functions", in (Cols. 11-366) the computer instructions cause the blending system to perform of linear approximation, accounting, and summing for each form to provide multiple fundamental basis.

28. Claim 30,

Freeman discloses, "wherein the instructions further cause the blending system to sum the cardinal basis functions to provide a function that describes the new form or motion within the abstract space", in (Cols. 11-

366) the computer instructions cause the blending system to perform of linear approximation, accounting, and summing for each form to provide multiple fundamental basis.

29. Claim 31,

Freeman discloses, "Wherein the instructions cause the blending system to select a point on the defined function and is render a new form or motion", in (Col. 3, lines 49-66) that multiplying values by coefficients and adding the results yields the new form or motions.

30. Claim 32,

Freeman discloses, "The computerized blending system of claim 28, wherein each radial basis function has a width that is a function of the distance between its associated example and the next nearest example in abstract space", in (Col. 2, lines 7-28) that the optimizer performs its function in accordance with the following formula: equation 1where the distance between its associated form and the next nearest form.

31. Claim 33,

Freeman discloses, "Wherein each radial basis function is selected from the b-spline family of radial basis functions", (Col. 2, lines 54-67) the body is transparent, and each marker is rendered to the image plane orthographically.

32. Claim 34,

Freeman discloses, "defining a set of examples that pertain to a form or motion that is to be animated, the examples being provided relative to a multi dimensional abstract space", in (Col. 2, lines 7-24) equation 1, which reflect the weights of the image data, the priors over human motions, and the interactively specified 2-d point matches.

Freeman discloses, "examining a plurality of forms or motions that are animated within the abstract space from the defined set of examples", in (col. 2, lines 29-39) that in the subject invention the 3-d reconstruction in a simplified image rendering domain utilizes a Bayesian analysis to provide analytic solutions to fundamental evaluation about estimating figural motion from image data.

Freeman discloses, "identifying at least one form or motion that is undesirable", that the invention relates to a system for recognizing (radial basis) of body motion and more particularly to a system for reconstructing an estimate of the 3-dimensional positions of a human body (combination of different portion) from a live or pre-recorded sequence of images of the body.

Freeman discloses, "selecting a form or motion from a location within the abstract space that is proximate a location that corresponds to the undesirable form or motion", in (Col. 9, lines 5-7) that the user can interactively specify the correct location of any stick figure part at any time frame. This effectively places a spring between the image position and the stick figure part at that particular time.

Freeman discloses, "replacing the undesirable form or motion with the selected form or motion to provide a pseudo-example that constitutes a linear sum of the examples of the set of examples", in (Col. 29, part of the program) that call to remove artificial (pseudo) edges.

33. Claim 35,

Freeman discloses, "linearly approximating a degree of freedom that is associated with a new form or motion that is to be rendered based upon the set of examples", in (Cols. 11-366) the computer instructions cause the blending system to perform of linear approximation, accounting, and summing for each form to provide multiple fundamental basis.

Freeman discloses, "defining a radial basis function for each of the examples; combining the linear approximation and the radial basis functions to provide a cardinal basis function", in (col. 2, lines 29-39) that in the subject invention the 3-d reconstruction in a simplified image rendering domain utilizes a Bayesian analysis to provide analytic solutions to fundamental evaluation about estimating figural motion from image data. Also in Fig. 8 shown the resulting estimates from evaluating a function to scaling individual weights for linear combination of basis functions.

Freeman discloses, "using the cardinal basis function to render the new form or motion", in (col. 2, lines 29-39) that in the subject invention the 3-d reconstruction in a simplified image rendering domain utilizes a Bayesian analysis to provide analytic solutions to fundamental evaluation about estimating figural motion from image data.

34. Claims 36 and 38

Freeman discloses, "Acts of linearly approximating and defining are performed for each example", in (Cols. 11-366) the computer instructions cause the blending system to perform of linear approximation, accounting, and summing for each form to provide multiple fundamental basis.

Freeman discloses, "combining each of the respective linear approximations and their associated radial basis functions to provide multiple cardinal basis functions, one for each example", in (Cols. 11-366) the computer

instructions cause the blending system to perform of linear approximation, accounting, and summing for each form to provide multiple fundamental basis.

Freeman discloses, "combining the multiple cardinal basis functions to define a function that describes the new form or shape within the abstract space", in (Cols. 11-366) the computer instructions cause the blending system to perform of linear approximation, accounting, and summing for each form to provide multiple fundamental basis. Also discloses in (Col. 29, part of the program) a call to remove artificial (pseudo) edges.

35. Claim 37,

Freeman discloses, "the radial basis functions are selected from a b-spline family of radial basis functions", (Col. 2, lines 54-67) the body is transparent, and each marker is rendered to the image plane orthographically.

36. Claim 39,

Freeman discloses, "defining at least two examples of a form, a first of the example forms being defined in a first position and a second of the example forms being defined in a second position that is different from the first position; computing a form in the first position such that when the computed form is subjected to a transform blending operation that places the computed form in the second position, it will match the second example form", this step is inherent because in order to define two different positions, one must have defined the first and second positions for computing the parameters which is involved.

37. Claim 40,

Freeman teaches, "the first position is a rest position", this step is inherent because the first position must be a start (rest) position.

38. Claim 41,

Freeman teaches, "the first position is a rest position and the second position is angularly displaced from the first position", this step is inherent because the first position must be a start (rest) position and second position angularly displaced since this work involves new form or motion.

39. Claim 42,

Freeman teaches, "computing a plurality of vertices associated with the form", in (Col. 27, part of program) take a list of points (plurality of vertices) in camera coordinates and transfer them into world coordinates.

40. Claim 43,

Freeman teaches, "after computing the plurality of vertices, geometrically blending the computed form in the first position with the first example form in the first position to provide a geometrically blended form in the first position", this step is inherent because in order to define two different positions, one must have defined the first and second positions for computing the parameters which is involved..

41. Claim 44,

Freeman teaches, "geometrically blending, transform blending the geometrically blended form to provide the form that matches the second example form", in (Col. 27, part of program) take a list of points (plurality

of vertices) in camera coordinates (first example) and transfer them into world coordinates (second example).

42. Claim 45,

Freeman teaches, "the example forms pertain to a skeleton-based figure", this step is inherent because the first example is an object that combination of parameters base on its skeleton.

43. Claim 46,

Freeman teaches, "define at least two examples of a form, a first of the example forms being defined in a first position and a second of the example forms being defined in a second position that is different from the first position", in (Col. 3, lines 49-66) that multiplying values by coefficients and adding the results yields the new form or motions.

Freeman teaches, "compute a form in the first position such that when the computed form is subjected to a transform blending operation that places the computed form in the second position, it will match the second example form", in (Col. 3, lines 49-66) that multiplying values by coefficients and adding the results yields the new form or motions. Freeman teaches in (Col. 27, part of program) take a list of points (plurality of vertices) in camera coordinates (first example) and transfer them into world coordinates (second example). This step is inherent because in order to define two different positions, one must have defined the first and second positions for computing the parameters, which is involved.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javid A Amini whose telephone number is 703-605-4248. The examiner can normally be reached on 8-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 703-305-4713. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-8705 for regular communications and 703-746-8705 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

Javid Amini
October 22, 2002

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